DETERMINANTS OF DISCHARGE TO LONG-TERM CARE AFTER A LOWER LIMB AMPUTATION

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To the Editor: Rehabilitation after lower limb amputation (LLA) in long-term care (LTC) has many positive outcomes, with up to 57% of the population successfully discharged within 12 months.[1] After LLA, it is important that rehabilitation begins without delay, particularly for older adults, who experience a rapid decline in physical conditioning.[2] Knowing who will be discharged to a LTC setting enables planning to begin immediately, even before surgery. Research from the United States and Finland has shown that being older, being female, living alone, and having a transfemoral amputation increases the chance of discharge to LTC.[3–5] The aim of this study was to investigate determinants of discharge to LTC after LLA in a Dutch setting.

METHODS

Medical records of all people who underwent a first transtibial (TTA), knee disarticulation (KD), or transfemoral (TFA) amputation due to vascular disease, infection, or diabetes mellitus between January 1, 2003, and December 31, 2004, were reviewed as part of a study on incidence of amputation. The primary dependent variable was discharge destination, recorded as LTC or other (home, inpatient rehabilitation, supported residential home, other hospital). Independent variables included were age, sex, level (TTA, unilateral proximal (KD or TFA), or multiple major amputations), living alone (includes single, widowed, divorced) or with a partner, living situation before amputation (care or home), and comorbidities (yes, no: diabetes mellitus, cardiac (myocardial infarction, cerebrovascular disease, or coronary artery bypass graft), lung disease, or renal disease). Variables with $P < .1$ in bivariate analyses were included in a logistic regression analysis (backward stepwise logistic regression).

RESULTS

Two hundred ninety-nine people with a first amputation were initially included. Fifty-six (19%) died before discharge from hospital and were excluded from further analyses. The mean age of the population discharged (n = 243) was 74.0 ± 11.4, 146 (60%) were male, and 114 (47%) underwent unilateral TTA and 70 (29%) unilateral TFA or KD. Five cases had missing data for discharge location. Bivariate analyses according to discharge location showed that sex, age, and living with a partner were all significantly associated with discharge location (Table 1). Logistic regression analyses showed that older people were more likely to be discharged to LTC (β (standard error) 0.053 (0.014); odds ratio = 1.05, 95% confidence interval = 1.03–1.08) $P < .001$; constant (standard error) −0.078 (0.157)).

DISCUSSION

Older age was the sole factor associated with discharge to LTC. Rehabilitation after LLA can take place in a number of settings, but most previous research has focused on inpatient rehabilitation programs. This setting yields the best outcomes in terms of longer survival, greater chance of receiving a prosthesis, greater mobility, being more likely to return to independent living, greater medical stability, fewer subsequent amputations, and better quality of life,[4,6–8] but inpatient rehabilitation programs operate with

Table 1. Determinants of Discharge to Long-Term Care

Characteristic	Long-Term Care, n = 130, 55%	Other, n = 108, 45%	*P*-Value
Sex, n (%)			
Female	60 (25)	35 (15)	.03
Male	70 (29)	73 (31)	
Age, mean ± standard deviation	76.5 ± 9.4	70.8 ± 12.6	<.001
Before amputation lived, n (%)			
With partner	48 (25)	58 (30)	.04
Alone	53 (27)	35 (18)	
Level, n (%)			
Unilateral transtibial	57 (24)	54 (23)	.14
Unilateral transfemoral or knee disarticulation	44 (19)	24 (10)	
Multiple major	27 (12)	28 (12)	
Admitted from, n (%)			
Home	70 (31)	71 (31)	.24
Care	49 (22)	36 (16)	
Comorbidities, n (%)			
Diabetes mellitus	73 (31)	52 (22)	.22
Cardiac	55 (23)	35 (15)	.12
Lung disease	34 (14)	23 (10)	.38
Kidney disease	27 (11)	17 (7)	.32

Characteristics were compared according to discharge location (LTC or other) using chi-square analysis for categorical variables and *t*-tests for age (normal distribution). Variables with $P < .10$ were included in a logistic regression model (stepwise backward logistic regression) with discharge location as the dependent variable. Statistical significance was set at $P < .05$, and analyses were performed in SPSS Statistics 20 (SPSS, Inc., Chicago, IL).

Not all categories sum to their respective totals because of missing data.

an intensive level of training, which a large proportion of the LLA population is unable to manage because of older age and comorbidity. Research of rehabilitation in LTC is gaining increasing interest,[1] because it may offer a suitable option for the older LLA population.

It is likely that differences in the model of care provided accounted for the different findings in this study from those in the literature. Studies on discharge destination are mainly limited to U.S. settings, where a much smaller percentage of people were discharged to LTC (18.5–21%,[5,9] vs 55% in the Netherlands). No association between amputation level and discharge to LTC[4,5] was found in the current study. In addition to differences in care models, inclusion of people with (partial) foot amputations in those studies might have contributed to the importance of amputation level on discharge, partial foot amputation being a less-aggressive procedure performed more frequently in a younger and somewhat healthier population.

This study covered a large regional population of all people undergoing LLA over a 2-year period, and findings can be generalized to the Dutch setting, but given that the design was a retrospective cross-sectional review, prospective, longitudinal studies should be undertaken to confirm the results. In the Netherlands, older adults can expect to be discharged to LTC after amputation.

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